Title: DEVICE FOR HEAT EXCHANGE
AND METHOD FOR PRODUCING
ONE SUCH DEVICE
Inventor(s): Gerrit WÖLK
DOCKET NO.: 016906-0536

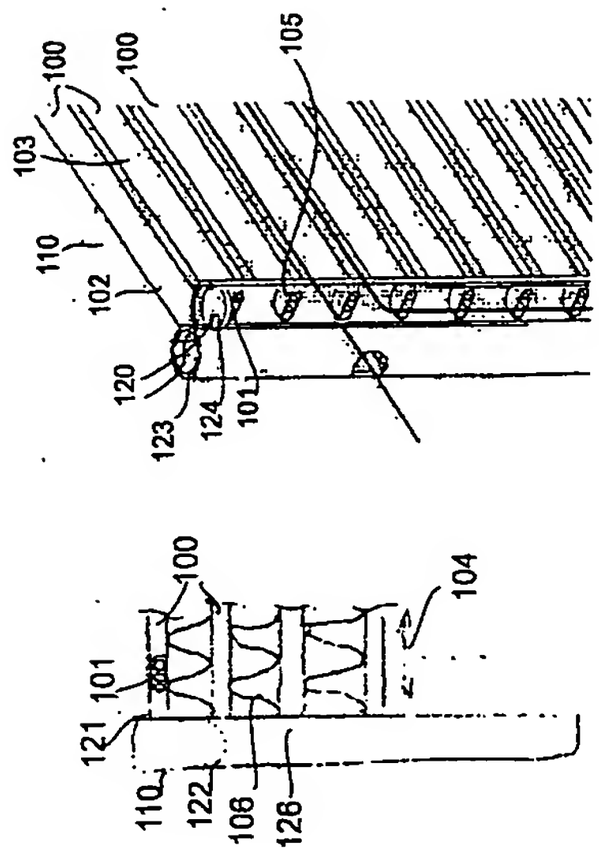

Fig. 1

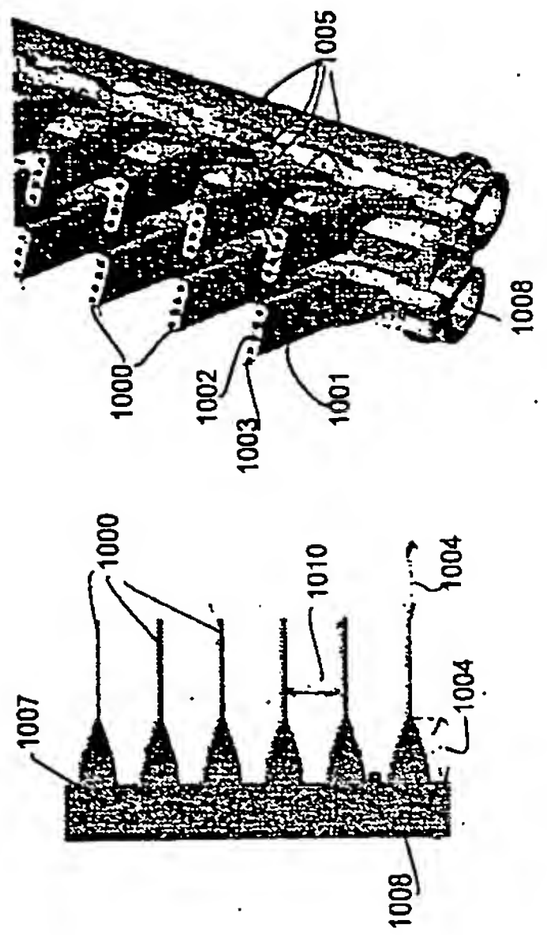

Fig. 10
State of the art

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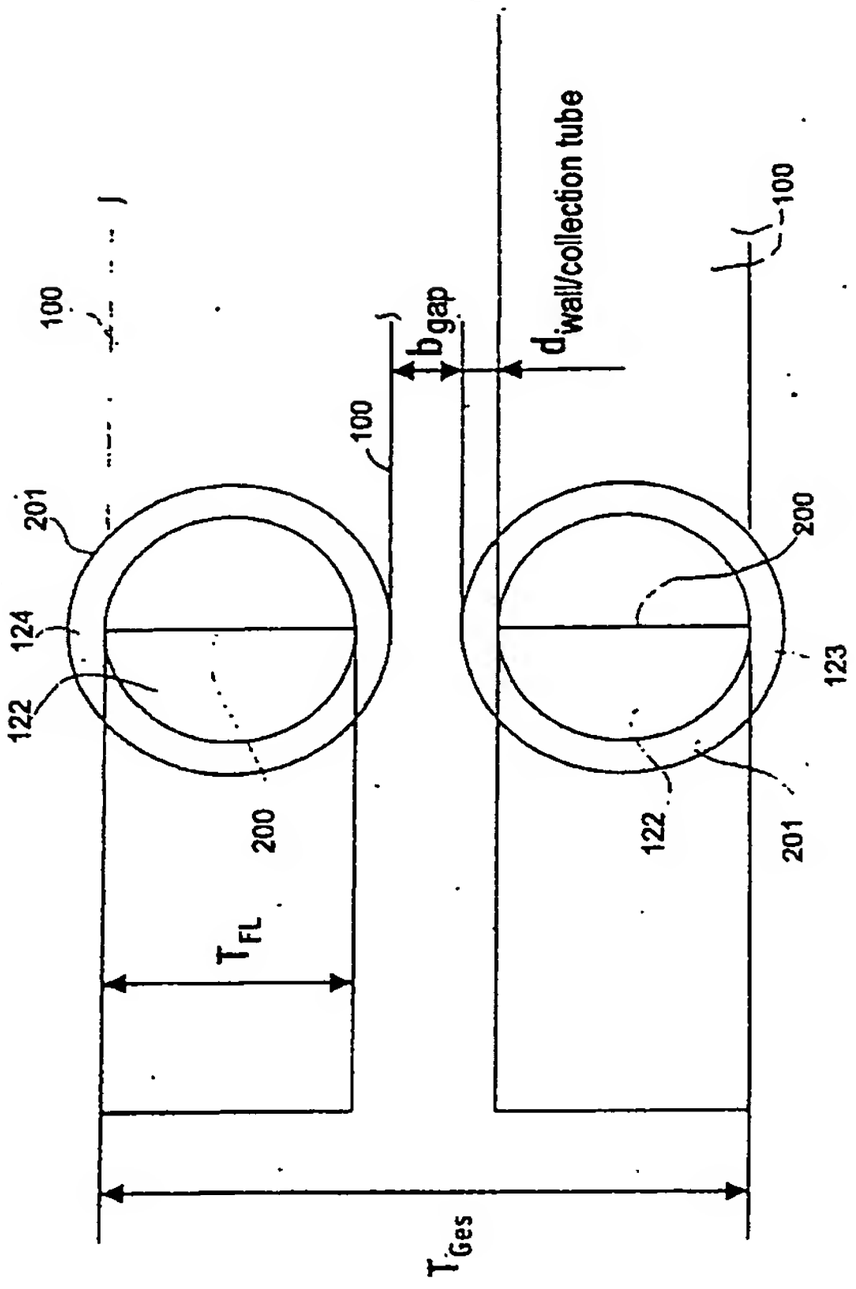
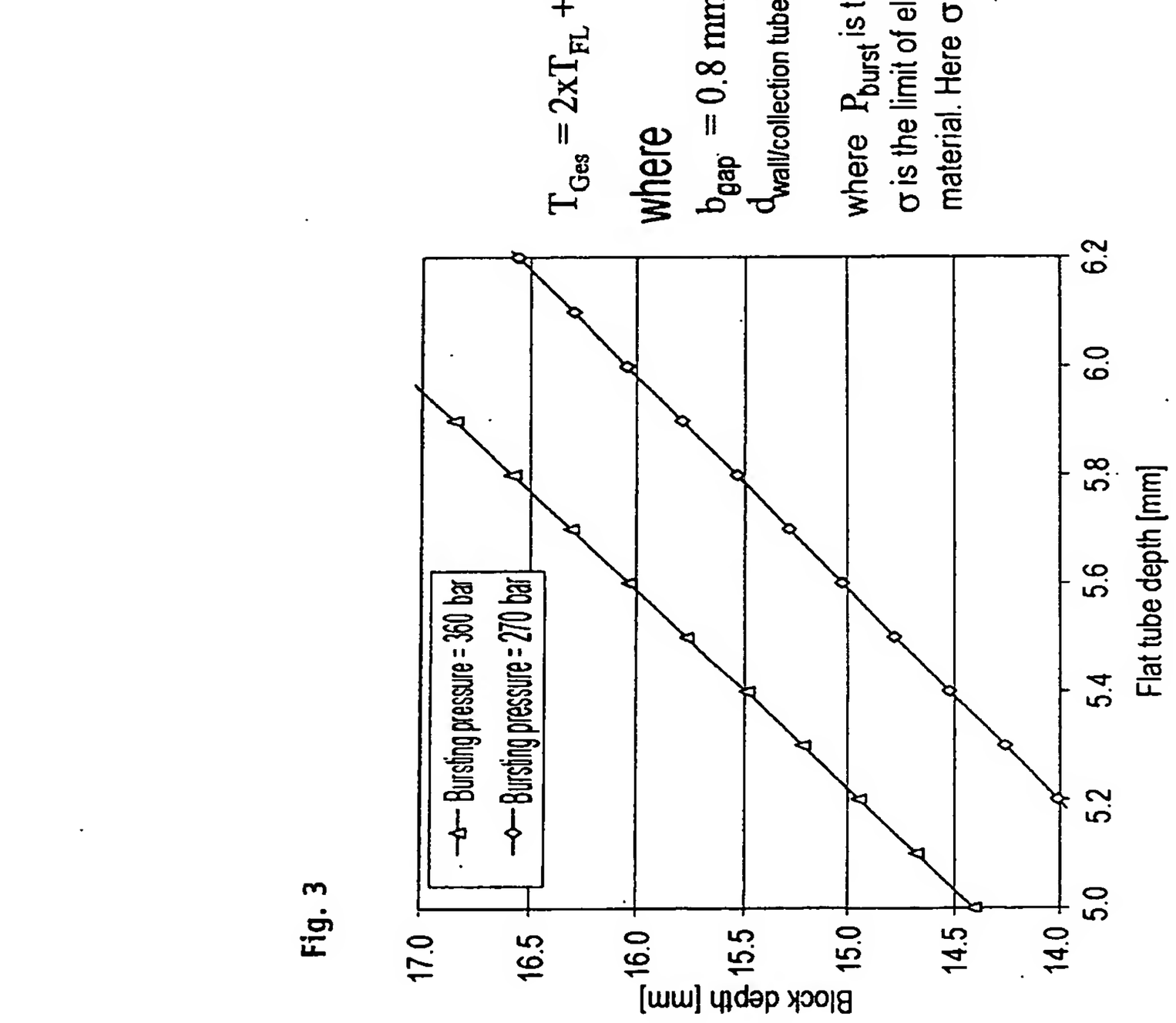


Fig. 2

Fig. 3



$T_{Ges} = 2xT_{FL} + 2xd_{wall,\ collection\ tube} + b_{gap}$

where

$b_{gap} = 0.8$ mm

$d_{wall/collection\ tube} = 0.1 * P_{burst} * T_{FL}/(2*\sigma)$

where P_{burst} is the bursting pressure and
σ is the limit of elasticity of the collection tube
material. Here $\sigma = 50\ N/mm^2$

$$T_{FL} = \frac{(T_{Ges} - b_{gap})}{2 + 0{,}2 * P_{burst}/(2*\sigma)}$$

where

$b_{gap} = 0.8$ mm

where P_{burst} is the bursting pressure and
σ is the limit of elasticity of the collection tube
material. Here $\sigma = 50$ N/mm²

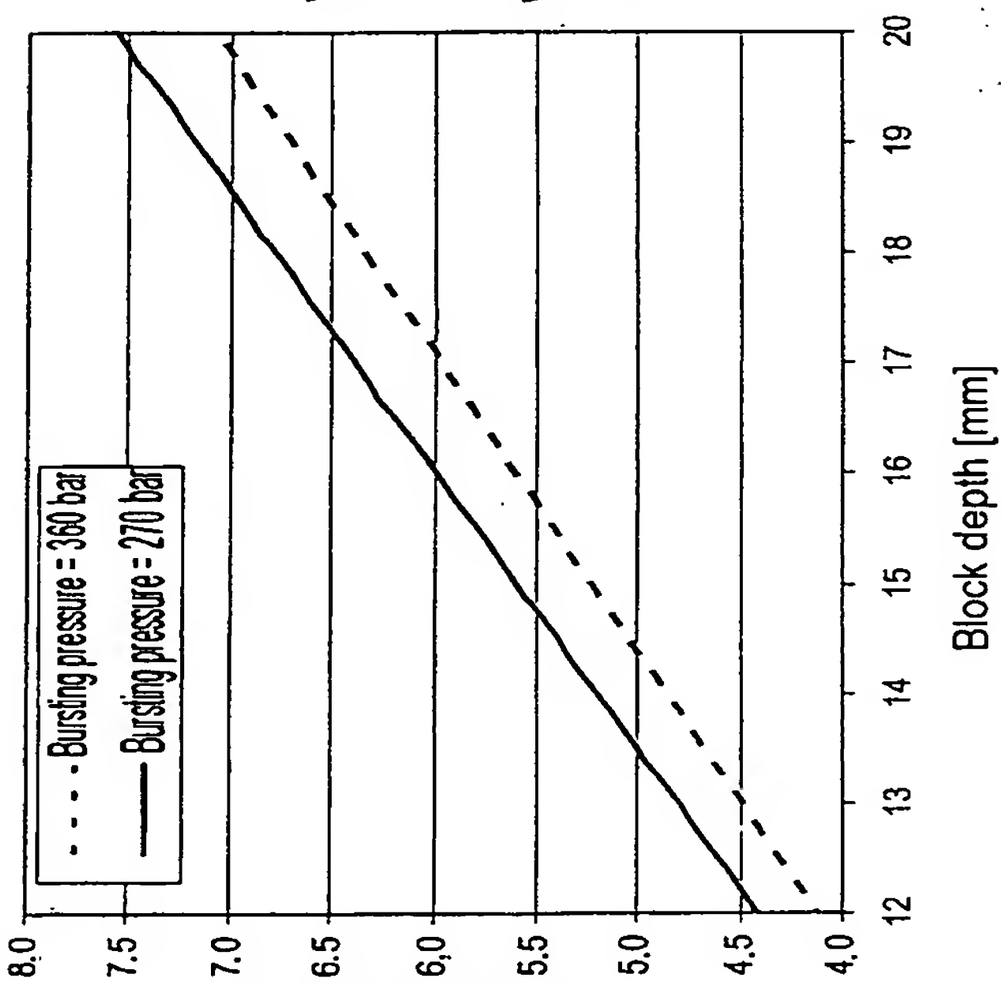


Fig. 4

Gas cooler:

Rib density 75 ri/dm
Rib height = 6 mm

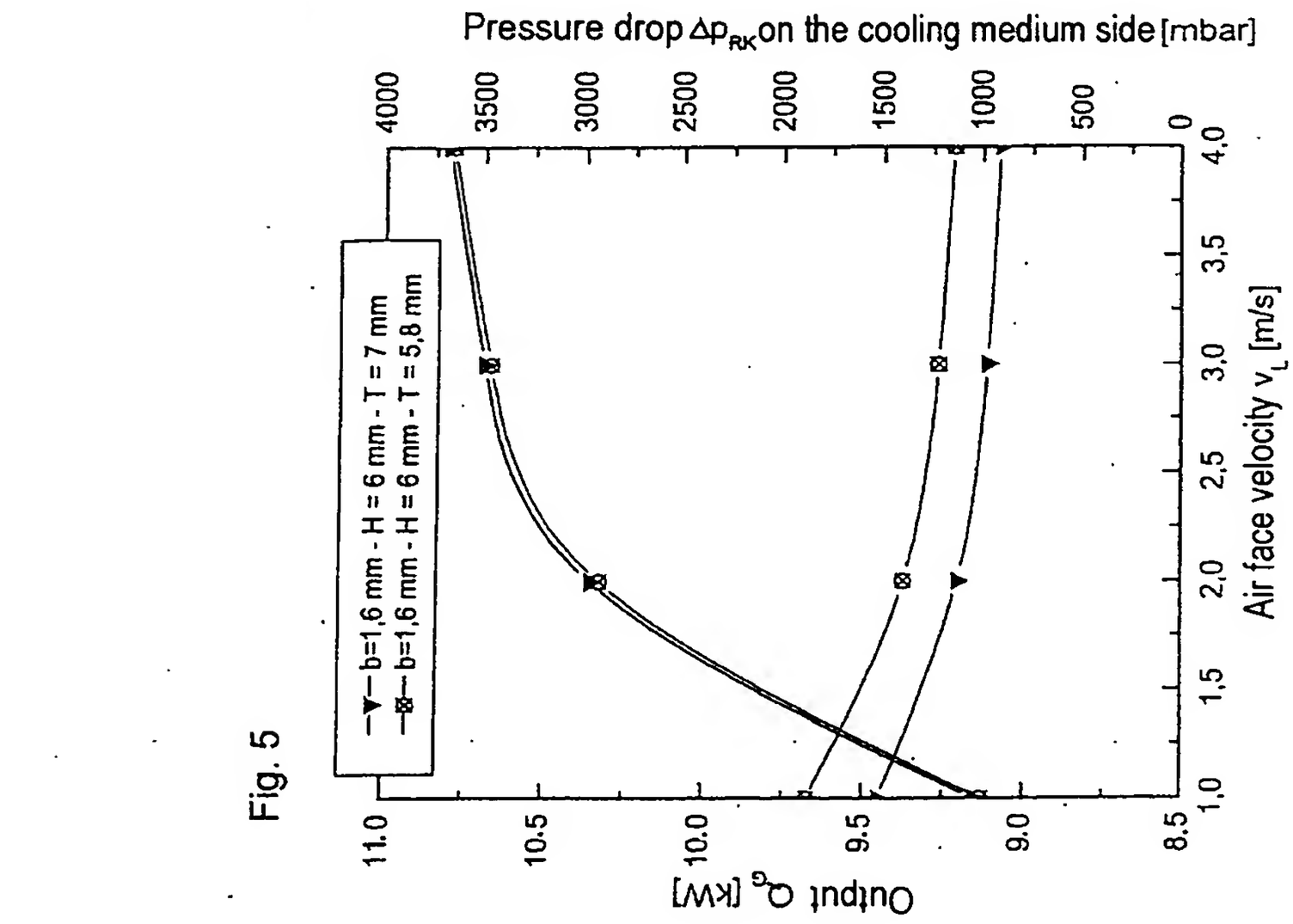
Tube: T=7 mm
B x H = 462.0 x 650 mm² F_{St} = 30.0 dm²
(1) HV 29/31 - 31/29

Tube: T=5.8 mm
B x H = 462.0 x 664 mm² F_{St} = 30.7 dm²
(2) HV 29/31 - 31/29

Marginal conditions:

Air temperature gas cooler inlet:	TLGE = 45°C
CO_2 temperature gas cooler inlet:	TRGE = 130°C
Gas cooler inlet pressure:	PRGE = 125 bar
Mass flow rate CO_2:	GR = 180 kg/h
Oil proportion:	1%

Fig. 5



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Tube: T=7 mm
B x H = 458.8 x 650 mm² F_{st} = 29.8 dm²
(1) HV 37/40 - 40/37

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(2) HV 37/40 - 40/37

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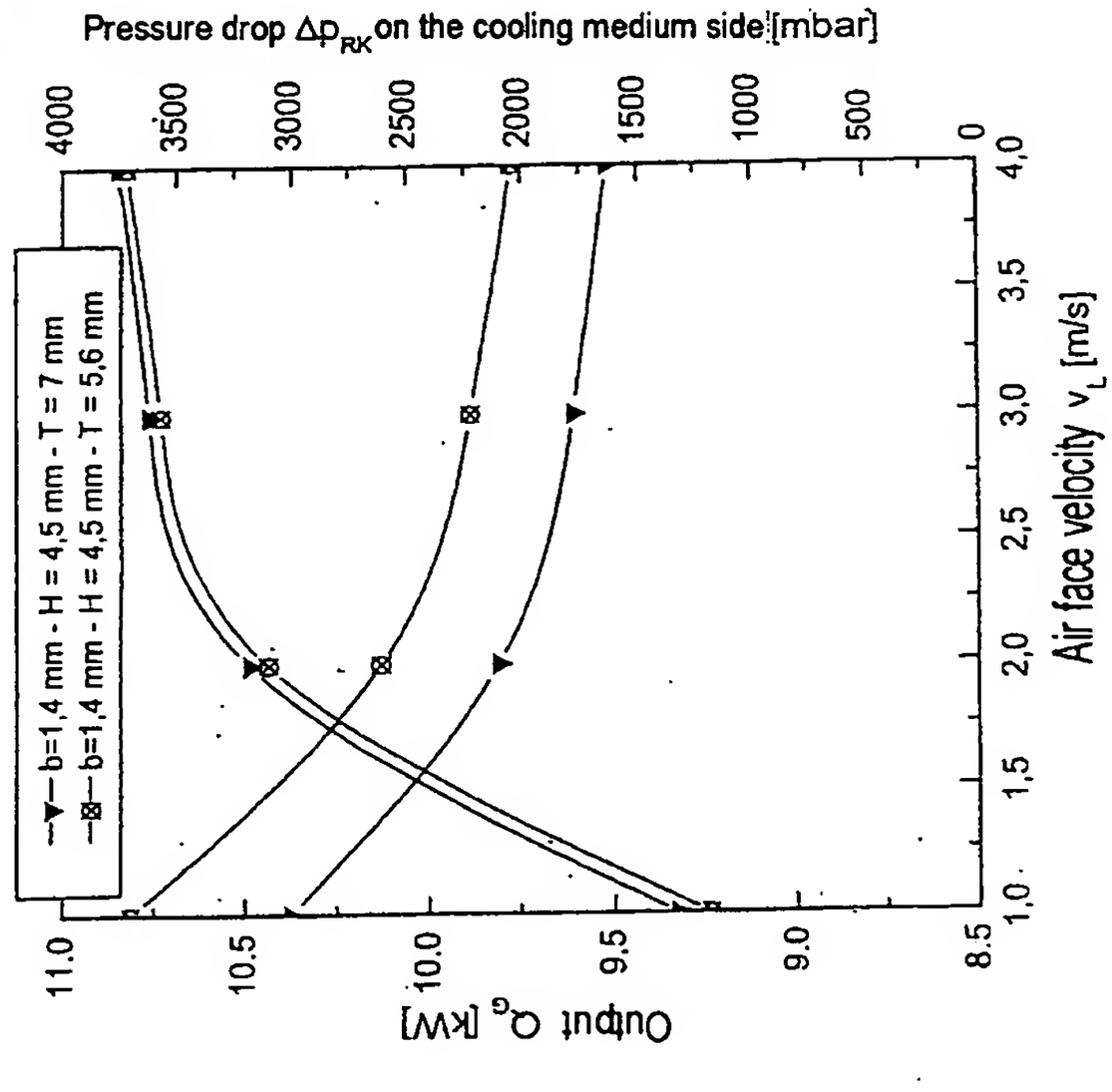

Fig. 6

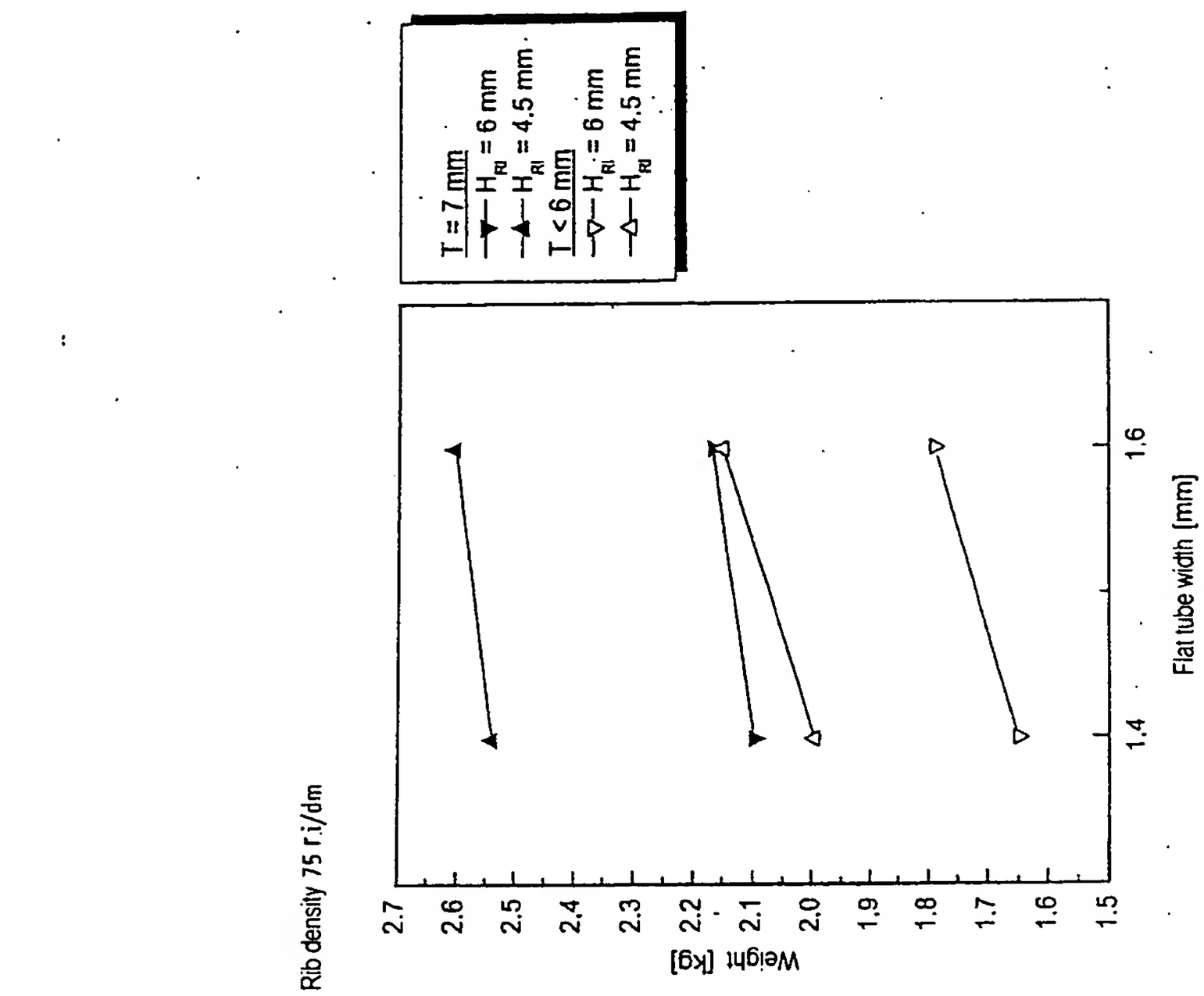
T = 7 mm
H_RI = 6 mm
H_RI = 4.5 mm
T < 6 mm
H_RI = 6 mm
H_RI = 4.5 mm
Rib density 75 r.i/dm
Weight [Kg]
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2,0
1,9
1.8
1.7
1.6
1.5
1,4
1,6
Flat tube width [mm]

Fig. 7

Fig. 8

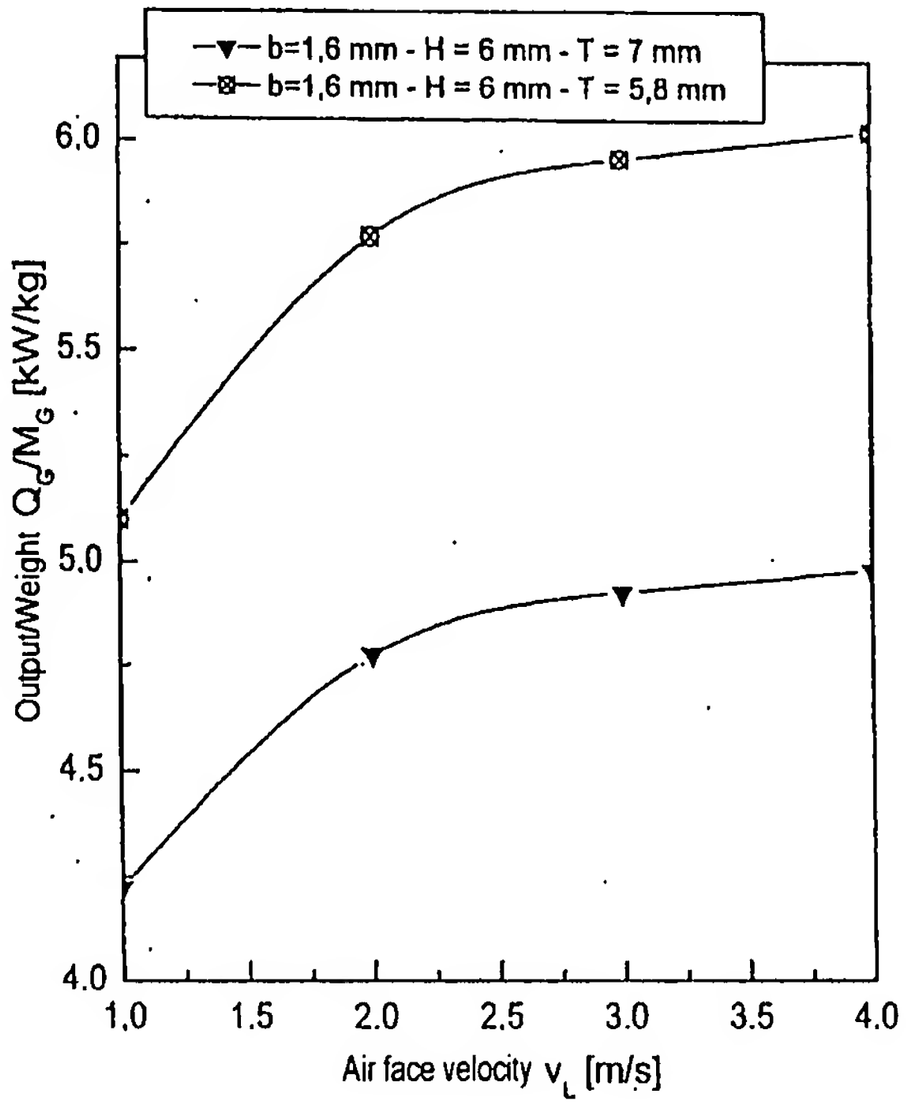

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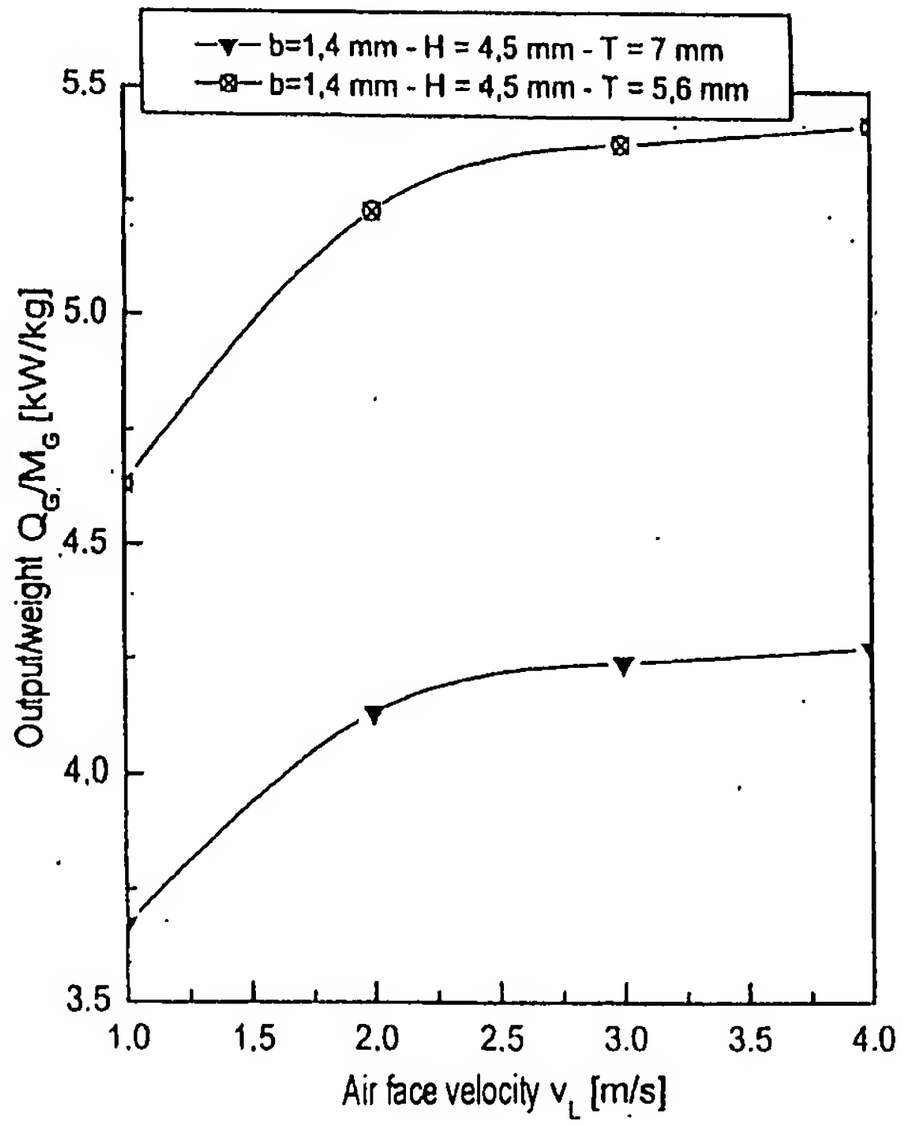
Fig. 9



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